## Amendments to the Claims

1. (Currently amended) A control unit for distributing multiplexed audio data over an optical network, the control unit comprising:

an audio sampler that samples a plurality of electrical signals from transducers and generates a plurality of raw audio data streams from the electrical signals, the audio sampler capable of sampling the electrical signals at a fraction of a frame synchronization rate ($F_s$) of the optical network;

a microcomputer having an audio processor function and a multiplexer function, wherein the audio processor function processes the plurality of raw audio data streams to generate a single processed audio data stream from the plurality of raw audio data streams at the frame synchronization rate ($F_s$) of the optical network, and wherein the multiplexer function multiplexes the plurality of raw audio data streams and the single processed audio data stream generated from the plurality of raw audio data streams to generate a multiplexed audio data stream having a plurality of frames, each frame having a plurality of time division multiplexed channels wherein a first channel within each frame is assigned to transmit the plurality of raw audio data streams and a second channel within each frame is assigned to transmit the single processed audio data stream; and

an optical network interface that receives the multiplexed audio data stream from the microcomputer and generates an optical multiplexed audio data stream based on the multiplexed audio data stream from the microcomputer.

2. (Original) The control unit of claim 1, wherein the frame synchronization rate ($F_s$) is provided by the optical network interface.

3. (Original) The control unit of claim 2, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-fourth ($F_s/4$).

4. (Original) The control unit of claim 2, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-half ($F_s/2$).

5. (Previously presented) The control unit of claim 1 further comprising a wireless device interface for connecting to a wireless communication device, the microcomputer capable of receiving audio data from the wireless device interface and generating a downlink audio data stream at the frame synchronization rate ($F_s$) of the optical network, wherein the multiplexer function of the microcomputer further multiplexes the downlink audio data stream to generate the multiplexed audio data stream having the plurality of frames wherein a third channel within each frame is assigned to transmit the downlink audio data stream.

6. (Original) The control unit of claim 1, wherein the first channel within each frame contains a data sample, the data sample having at least two bits that identify a time slot within the first channel corresponding to the raw audio data stream.

7. (Previously presented) The control unit of claim 1, wherein each frame has at least one channel assigned to transmit control data.

8. (Original) The control unit of claim 7, wherein the control data includes information to inform a secondary audio processing unit about the characteristics of the first channel within each frame.

9. (Currently amended) A control unit for distributing multiplexed audio data over an optical network from a first transducer and a second transducer, the control unit comprising:

an audio sampler that samples a first electrical signal from the first transducer and a second electrical signal from the second transducer, and generates a first raw audio data stream and a second raw audio data stream from the first and second electrical signals;

a microcomputer having an audio processor function and a multiplexer function, wherein the audio processor function processes the first and second raw audio data streams to generate a single processed audio data stream from the first and second raw audio data streams, wherein the multiplexer function multiplexes the first and second raw audio data streams and the single processed audio data stream generated from the first and second raw audio data streams to generate a multiplexed audio data stream having a first and second frame, each frame having a plurality of time division multiplexed channels wherein a first sample of the first raw audio data stream is transmitted in a first channel during the first frame, a first sample of the single processed audio data stream is transmitted in a second channel during the first frame, a first sample of the second raw audio data stream is transmitted in the first channel during the second frame, and a second sample of the single processed audio data stream is transmitted in the second channel during the second frame; and

an optical network interface that receives the multiplexed audio data stream from the microcomputer and generates an optical multiplexed audio data stream based on the multiplexed audio data stream from the microcomputer.

10. (Original) The control unit of claim 9, wherein the audio sampler is further capable of sampling first and second electrical signals at a fraction of a frame synchronization rate ($F_s$) of the optical network.

11. (Original) The control unit of claim 10, wherein the frame synchronization rate ($F_s$) is provided by the optical network interface.

12. (Original) The control unit of claim 11, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-fourth ($F_s/4$).

13. (Original) The control unit of claim 11, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-half ($F_s/2$).

14. (Previously presented) The control unit of claim 9 further comprising a wireless device interface for connecting to a wireless communication device, the microcomputer capable of receiving audio data from the wireless device interface and generating a downlink audio data stream, wherein the multiplexer function of the microcomputer further multiplexes the downlink audio data stream to generate the multiplexed audio data stream wherein a first sample of the downlink audio data stream is transmitted in a third channel during the first frame and a second sample of the downlink audio data stream is transmitted in the third channel during the second frame.

15. (Previously presented) The control unit of claim 9, wherein the first and second sample of the first raw audio data stream each having at least two bits that the identify a time slot

within the first channel that corresponds to the first transducer, the first and second sample of the second raw audio data stream each having has at least two bits that identify a time slot within the first channel that corresponds to the second transducer.

16. (Currently amended) The control unit of claim 1, wherein the multiplexer function of the microcomputer further multiplexes a control data stream to generate the [[a]] multiplexed audio data stream wherein a first sample of the control data stream is transmitted in at least one channel during the first frame and a second sample of the control data stream is transmitted in the at least one channel during the second frame.

17. (Original) The control unit of claim 16, wherein the control data includes information to inform a secondary audio processing unit about the characteristics of the first channel within the first and second frames.

18. (Currently amended) A system for distributing audio data over an optical network in a vehicle, the system comprising:

a plurality of transducers convert sound within a cabin of the vehicle to electrical signals;

a control unit having an audio sampler, a microcomputer, and an optical network interface, wherein:

the audio sampler samples the electrical signals from the plurality of transducers and generates a plurality of raw audio data streams from the electrical signals;

the microcomputer has an audio processor function and a multiplexer function, the audio processor function processing the plurality of raw audio data streams to generate a single processed audio data stream from the plurality of raw audio data streams, the multiplexer function multiplexing the plurality of raw audio data streams and the single processed audio data stream generated from the plurality of raw audio data streams to generate a multiplexed audio data stream having a plurality of frames, each frame having a plurality of time division multiplexed channels wherein a first channel within each frame is assigned to transmit the plurality of raw audio data streams and a second channel within each frame is assigned to transmit the single processed audio data stream;

the optical network interface receives the multiplexed audio data stream from the microcomputer and generates an optical multiplexed audio data stream based on the multiplexed audio data stream from the microcomputer; and

a secondary audio processing unit connected to the optical network that receives and processes the optical multiplexed audio data stream.

19. (Original) The system of claim 18, wherein the audio sampler is further capable of sampling the electrical signals at a fraction of a frame synchronization rate ($F_s$)of the optical network.

20. (Original) The system of claim 19, wherein the frame synchronization rate ($F_s$) is provided by the optical network interface.

21. (Original) The system of claim 20, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-fourth ($F_s/4$).

22. (Original) The system of claim 20, wherein the fraction of the frame synchronization rate of the optical network sampled by the audio sampler is one-half ($F_s/2$).

23. (Previously presented) The system of claim 18 further comprising a wireless device interface for connecting to a wireless communication device, the microcomputer capable of receiving audio data from the wireless device interface and generating a downlink audio data stream, the multiplexer function of the microcomputer further multiplexes the downlink audio data stream to generate the multiplexed audio data stream having the plurality of frames wherein a third channel within each frame is assigned to transmit the downlink audio data stream.

24. (Original) The system of claim 18, wherein the first channel within each frame contains a data sample, the data sample having at least two bits that identify a time slot that corresponds to the raw audio data stream.

25. (Previously presented) The system of claim 18, wherein each frame has at least one channel assigned to transmit control data.

26. (Original) The system of claim 25, wherein the control data includes information to inform a secondary audio processing unit about the characteristics of the first channel within each frame.

27. (Currently amended) A method for distributing multiplexed audio data over an optical network, the method comprising the steps of:

sampling a plurality of electrical signals from transducers at a fraction of a frame synchronization rate ($F_s$) of the optical network and generating a plurality of raw audio data streams;

processing the plurality of raw audio data streams and generating a single processed [[raw]] audio data stream from the plurality of raw audio data streams at a frame synchronization rate ($F_s$) of the optical network;

multiplexing the plurality of raw audio data streams together with the single processed [[raw]] audio data stream generated from the plurality of raw audio data streams to generate a multiplexed audio data stream having a plurality of frames, each frame having a plurality of time division multiplexed channels wherein a first channel within each frame is assigned to transmit the plurality of raw audio data streams and a second channel within each frame is assigned to transmit the single processed audio data stream; and

converting the multiplexed audio data stream into an optical multiplexed audio data stream for transmission over the optical network.

28. (Original) The method of claim 27, wherein the frame synchronization rate ($F_s$) is provided by an optical network interface.

29. (Original) The method of claim 27, wherein the fraction of the frame synchronization rate ($F_s$) of the optical network is one-fourth ($F_s/4$).

30. (Original) The method of claim 27, wherein the fraction of the frame synchronization rate ($F_s$) of the optical network is one-half ($F_s/2$).

31. (Currently amended) The method of claim 27 further comprising the steps of:

receiving a downlink audio data stream from a wireless communication device; and

multiplexing the plurality of raw audio data streams, the single processed [[raw]] audio data stream, and the downlink audio data stream to generate the multiplexed audio data stream having the plurality of frames wherein a third channel within each frame is assigned to transmit the downlink audio data stream.

32. (Original) The method of claim 27 wherein the first channel within each frame contains a data sample, the data sample having at least two bits that identify a time slot that corresponds to the raw audio data stream.

33. (Currently amended) The method of claim 27 further comprising the steps of:

generating a control data stream; and

multiplexing the plurality of raw audio data streams, the single processed [[raw]] audio data stream, and the control data stream to generate the multiplexed audio data stream having the plurality of frames wherein at least one channel within each frame is assigned to transmit the downlink audio data stream.

34. (Original) The method of claim 33 wherein the control data stream includes information to inform a secondary audio processing unit about the characteristics of the first channel within each frame.